Multi-scale brain connectivity with diffusion MRI

Propositions of the thesis

Multi-scale brain connectivity with diffusion MRI

Matteo Bastiani

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1. The choice of tractography algorithm dramatically affects global structural network indices derived for the human connectome.

2. Comparative connectomics analysis offers a quantitative basis for translating findings between species.

3. Diffusion MRI can define both the edges and the nodes of the human connectome.

4. Protocol optimization and high amplitude gradient sets are fundamental to probe white matter microstructure in vivo.

5. When modelling the function of the brain, an accurate diagram of its wiring must be incorporated as a parameter.

6. The study of neuroanatomy requires a multimodal approach.

7. Sharing of data, algorithms and knowledge is fundamental as it can accelerate new discoveries and help avoiding mistakes.

8. Mapping the structural architecture of the brain is a multidisciplinary effort that can bring benefits to the fields of medicine, engineering and education.

9. "In the knowable realm, the form of the good is the last thing to be seen, and it is reached only with difficulty. Once it is seen, however, one must conclude that it is the cause of all that is correct and beautiful in anything […]". *Plato*

10. "You should abandon science if your soul isn't flooded with the emotion of anticipated pleasure when approaching the long-awaited and solemn moment of the *fiat lux*. Nature grants not her favors to those with a cold heart […]". *Santiago Ramon y Cajal*

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